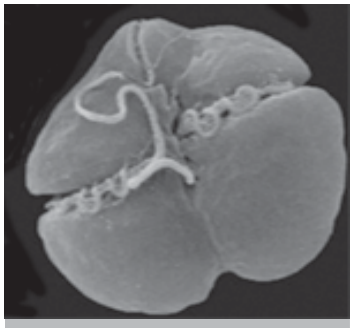
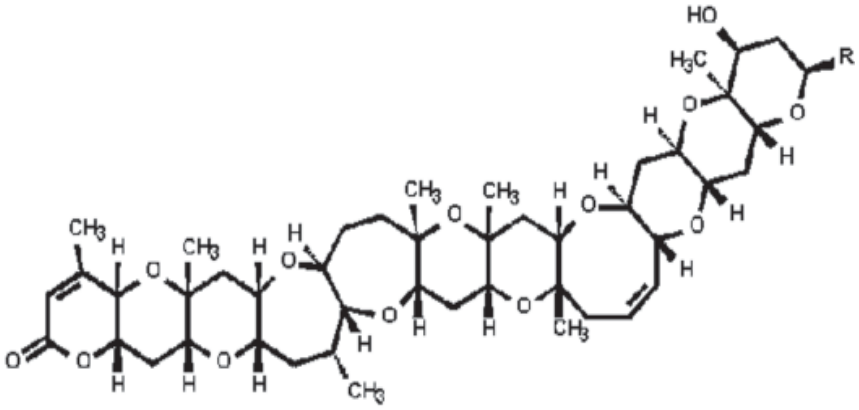


Species/Syndrome Distribution: *Karenia brevis* is a toxic dinoflagellate found in the Gulf of Mexico along the Texas and Louisiana coasts, the east coast of Florida, and as far north as North Carolina. *K. brevis* red tides are typically characterized by patches of discolored water, dead or dying fish, and toxic aerosols resulting in respiratory irritation in humans. Similar nontoxic species have been found worldwide.

Toxins/Mode of Action: Brevetoxins (PbTx) and related derivatives

Brevetoxins are lipid soluble polyethers that lower the activation threshold of voltage dependent sodium channels and enhance depolarization of nerve cells, leading to uncontrolled Na+ influx into the cell.



Chemical Structure of PbTx - 2

Human Health Syndrome: Neurotoxic Shellfish Poisoning (NSP)

Neurotoxic shellfish poisoning (NSP) produces gastrointestinal and neurological symptoms within 3 to 6 hours of ingestion of contaminated shellfish. Milder cases may include symptoms of headaches, diarrhea, and muscle/ joint pain. More severe effects are altered perceptions of hot and cold, difficulty breathing, or double vision. Milder toxicity commonly occurs on beaches where people are exposed to toxin aerosols produced by wave action. Symptoms include irritation of the throat and upper respiratory tract causing asthma-like effects.